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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ERIC R. LOVEGREN, KURT C. DIEDE  
and RYAN R. CARLSON

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Appeal 2009-0152  
Application 09/667,297  
Technology Center 2800

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Decided: January 12, 2009

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Before KENNETH W. HAIRSTON, JOHN A. JEFFERY,  
and ELENI MANTIS MERCADER, *Administrative Patent Judges*.

MANTIS MERCADER, *Administrative Patent Judge*.

DECISION ON APPEAL

#### STATEMENT OF THE CASE

Appellants seek our review under 35 U.S.C. § 134 of the Examiner's rejection of claims 17-20, 25, 31, 34, 37, 39, and 43-45. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

#### INVENTION

Appellants' claimed invention is directed to a method and apparatus for setting threshold values for use by a radar level transmitter to detect reflected wave pulses corresponding to portions of a transmitted microwave pulse which reflect from interfaces contained in a container (Spec. 4:3-7). The reflected wave pulses are received by a radar antenna and Time Domain Reflectometry (TDR) principles are used by the radar level transmitter to calculate the levels of first and second material interfaces (Spec. 6:7-13).

Claim 17, reproduced below, is representative of the subject matter on appeal:

17. A radar level transmitter for providing level detection of materials in a container, the transmitter comprising:

an antenna;

a transceiver coupled to the antenna and configured to transmit a microwave pulse, having a transmit pulse amplitude, using the antenna and produce a signal representing reflected wave pulses;

a microprocessor system coupled to the transceiver and adapted to control the transceiver and process the signal;

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a threshold calculation module executable by the microprocessor system and adapted to receive information related a dielectric constant of a first material and a dielectric constant of a second material and calculate an estimated fiducial pulse amplitude related to a reflected wave pulse from an interface between the antenna and the first material and an estimated first pulse amplitude related to a reflected wave pulse from a first material interface between the first material and the second material, the threshold calculation module further adapted to set a fiducial threshold value based upon the estimated fiducial pulse amplitude and set a first threshold value based upon the estimated first pulse amplitude; and a level calculation module executable by the microprocessor system and adapted to establish a level in the container of the first material interface using the signal, the fiducial threshold value and the first threshold value.

#### THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

De Carolis	US 3,812,422	May 21, 1974
Reddy	US 5,134,377	Jul. 28, 1992
McEwan	US 5,609,059	Mar. 11, 1997
Kielb	US 5,672,975	Sep. 30, 1997
Rost	US 6,087,977	Jul. 11, 2000
Carsella	US 6,626,038 B1	Sep. 30, 2003 (filed Jun. 18, 1998)

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The following rejections are before us for review:

1. The Examiner rejected claims 17-19 and 43 under 35 U.S.C. § 103(a) as being unpatentable over Carsella in view of Reddy, III.
2. The Examiner rejected claims 25, 31, 34, and 39 under 35 U.S.C. § 103(a) as being unpatentable over Carsella in view of Reddy, III and Rost.
3. The Examiner rejected claims 20, 37, and 45 under 35 U.S.C. § 103(a) as being unpatentable over Carsella in view of Reddy, III and De Carolis.
4. The Examiner rejected claim 44 under 35 U.S.C. § 103(a) as being unpatentable over Carsella in view of Reddy, III and Kielb.

## OBVIOUSNESS

### ISSUE

The Examiner asserts that since the invention of Carsella specifically discloses employing thresholds for detecting reflections at the first, second, and fiducial interfaces (by incorporating by reference McEwan; col. 8, l. 66- col. 9, l. 3) and Reddy suggests employing thresholds specifically adapted to the particular conditions being measured, the combination would have employed a specific threshold for detecting each of the reflections at the first, second, and fiducial interfaces (Ans. 6 and 15; col. 1, l. 64-col. 2, l. 2 and col. 8, l. 63-col. 9, l. 5).

Appellants contend *inter alia* that claim 17 requires that the threshold calculation module calculates an estimated first pulse amplitude related to a reflected wave pulse from a first material interface between first and second materials (App. Br. 6). Thus, claim 17 includes calculating two estimated pulse amplitudes, an estimated fiducial pulse amplitude and an estimated first pulse

amplitude (App. Br. 6 and Reply Br. 2). In the cited section, the Reddy reference shows no calculation of a second estimated pulse amplitude (App. Br. 6 and Reply Br. 2).

The issue before us, then, is as follows:

Have the Appellants shown that the Examiner erred by determining that Carsella (incorporating by reference McEwan) in view of Reddy teach “an estimated first pulse amplitude” as recited in claim 17?

#### FINDINGS OF FACT

The relevant facts include the following:

1. Reddy teaches calculating estimated reflection pulses from a first material interface as a function of a reference amplitude of the transmitted microwave pulse (i.e., negative detection threshold; col. 9, ll. 6-9) and the amplitude of the reflected pulse amplitude (i.e., level of detected reflection; col. 9, ll. 9-10).
2. Reddy further teaches setting corresponding threshold values based on the estimated reflected pulse amplitude (col. 1, l. 64-col. 2, l. 2 and col. 9, ll. 6-20).
3. Reddy teaches calculations solely for the purpose of determining “impedance changes which are caused *when a cable is contacted by a leaking liquid*” (emphasis added) (col. 1, ll. 40-44).
4. Reddy’s recited calculations for autoreferencing the cable (col. 9, ll. 6-20) are only applicable for a cable (i.e., antenna) and the leaked liquid (i.e., first

material) which is similar to Appellants' disclosed determination of the fiducial amplitude (Spec. 11:29-12:4).

5. Reddy's calculations have nothing to do with detecting levels of liquids, and there is no suggestion to calculate "an estimated first pulse amplitude related to a reflected wave pulse . . . between *the first material and the second material*" (emphasis added) (i.e., the level of a first leaked liquid and the level of a second leaked liquid).

#### PRINCIPLES OF LAW

The Examiner bears the initial burden of presenting a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If that burden is met, then the burden shifts to the Appellants to overcome the *prima facie* case with argument and/or evidence. *Id.* The Supreme Court, citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), stated that "'[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007).

## ANALYSIS

*Have the Appellants shown that the Examiner erred by determining that Carsella (incorporating by reference McEwan) in view of Reddy teach “an estimated first pulse amplitude” as recited in claim 17?*

Reddy teaches calculating estimated reflection pulses from a first material interface as a function of a reference amplitude of the transmitted microwave pulse (i.e., negative detection threshold) and the amplitude of the reflected pulse amplitude (i.e., level of detected reflection) (Finding of Fact 1). Reddy further teaches setting corresponding threshold values based on the estimated reflected pulse amplitude (Finding of Fact 2). Reddy teaches these calculations solely for the purpose of determining “impedance changes which are caused *when a cable is contacted by a leaking liquid*” (emphasis added) (Finding of Fact 3). Thus, the recited calculations for the autoreferencing of the cable are only applicable for a cable (i.e., antenna) and a leaked liquid (i.e., first material) interface which is similar to Appellants’ disclosed determination of the fiducial amplitude (Finding of Fact 4). The calculations have nothing to do with detecting levels of liquids, and thus, there are no disclosed calculations or any suggestions on how to calculate “an estimated *first pulse amplitude* related to a reflected wave pulse . . . between *the first material and the second material*” (emphasis added) (i.e., the level of a first leaked liquid and the level of a second leaked liquid) (Finding of Fact 5).

Thus, the Examiner’s articulated reasoning (i.e., that the combination would have employed a specific threshold as taught by Reddy for detecting each of the reflections at the first, second, and fiducial interfaces as taught by McEwan) does not have a rational underpinning to support the legal conclusion of obviousness.

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*KSR*, 127 S. Ct. at 1741.

For the above reasons, Appellants have shown error in the Examiner's rejection of claims 17-19 and 43 under 35 U.S.C. § 103(a) based on the collective teachings of Carsella, McEwan, and Reddy, III. Furthermore, De Carolis, Kielb, and Rost do not remedy the shortcomings of Carsella, McEwan and Reddy as pointed out by Appellants. We are therefore likewise persuaded of error in the Examiner's obviousness rejections of claims 20, 25, 31, 34, 37, 39, 44, and 45 under 35 U.S.C. § 103(a) for similar reasons as these claims depend directly or indirectly from independent claim 17.

#### CONCLUSION OF LAW

Appellants have shown that the Examiner erred by determining that Carsella (incorporating by reference McEwan) in view of Reddy teaches "an estimated first pulse amplitude" as recited in independent claim 17. Appellants have also shown that the Examiner erred in rejecting the dependent claims over the collective teachings of the cited prior art under § 103.

#### ORDER

The decision of the Examiner to reject claims 17-20, 25, 31, 34, 37, 39, and 43-45 under 35 U.S.C. § 103(a) is reversed.

REVERSED

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gvw

WESTMAN CHAMPLIN & KELLY, P.A.  
SUITE 1400  
900 SECOND AVENUE SOUTH  
MINNEAPOLIS, MN 55402-3244